MENTAL FUNCTIONS

A short essay on Theoretical Psychology.

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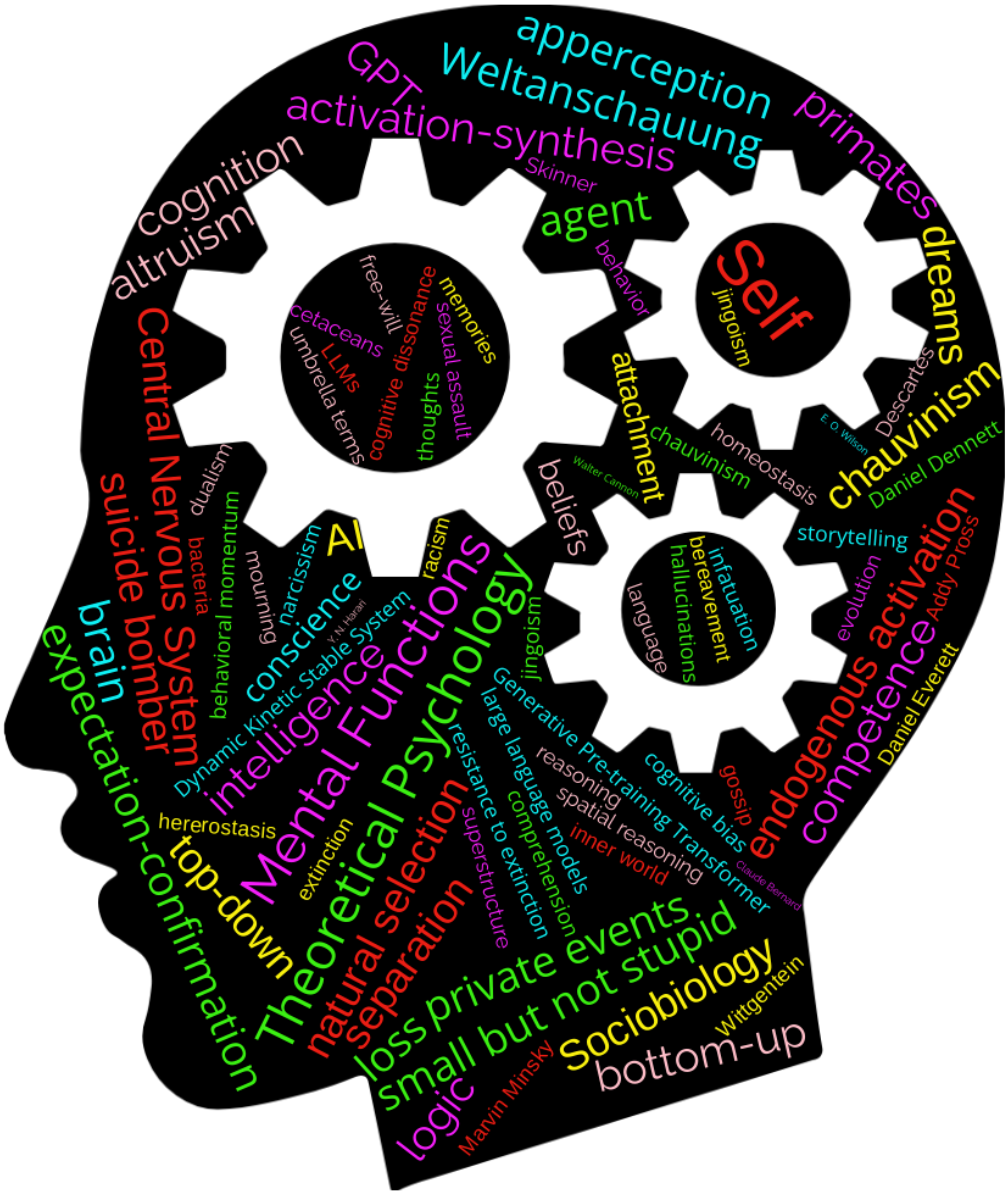

Abstract: This essay argues that mental functions—Self, intelligence, attachment, consciousness, dreams—are to be explained, not used as explanations. Following Minsky and Dennett, it treats them as suitcase words: hundreds of loosely connected functions, running bottom-up, not designed to comprehend themselves. The Self is a necessary illusion with weak command over the rest. Beliefs do not guide behavior; people use, tweak, and adapt beliefs to rationalize behaviors that satisfy biological imperatives. Artificial intelligence, however powerful, is nowhere near agency, because agency is a property of living beings. You are cleverer than AI, but evolution is cleverer than you are.
Keywords: Mental functions, psychology, Self, consciousness, beliefs, dreams, attachment, agency, storytelling, brain, mind, AI, artificial intelligence, large language models, LLMs.
36 references, 32 pages.

Preface.

Our notion of the human mind as the most marvelous, ineffable, abstract, immaterial entity in the universe has received a most severe blow with the introduction of wide public access to *generative artificial intelligence*, in particular *large language models* (LLMs) that write essays, poems, pitches, gives advice, offers explanations, write IT programs in most available coding languages, translate codes and natural languages, produce images, sounds and music, make sentiment analysis showing empathy, and preform all these tasks at a superhuman speed with from very acceptable to high quality by any standards. Moreover, new even better performing versions are announced and expected.

All these intellectual feats are done by machines that don't understand anything, have no feelings or needs or experiences, no **agency**. Just machines that only 'know' to process commands delivered in a binary language of 1 and 0 called *bits,* or in the case of quantum computers, of values between 1 and 0 called *qubits*.

This remarkable achievement in information technology not only evokes a sense of awe and wonder, but also raises alarmed concerns about job destruction and even the potential risk of extinction for our species.

As our admiration for the accomplishments of artificial intelligence grows, our fascination with our own natural intelligence wanes.

This opportunity for modesty is especially appropriated to reflect about our 'reflecting organ' that we label *mind*. It's a good occasion to inquire about what psychology has to say about this subject.

We will try to unveil the concept of *mind*, and to explain some of its main functions. We will also try to draw some comparisons between mental functions and artificial intelligence and address the worries provoked by the prowess of the latter.

To help the readers to focus their attention on the understanding of this short but difficult essay, we give three ‘spoilers’:

1. The subject is difficult because the *mind* is not ‘made’ with the purpose of understanding itself.
2. The big question is not *what is inside the mind*, but *inside what is the mind* [1]. That is, that the *mind* is in the *brain and body* of a social being that is immersed in a *culture*. The understanding of the *human mind* depends on *cultural anthropology, psychology, linguistics, and other human and social sciences* as much as it depends on *neurophysiology and human biology*.
3. Artificial intelligence will not take control over the world because it has no *agency*. Only living beings have *minds*. No technology can produce a living being from scratch. The most primitive bacterium has *agency*, the most sophisticated and advanced machine doesn’t.

All this, and more, we will try to explain with some detail in the few pages that follow. Please take in consideration that this is a short essay and not a textbook. Some relevant textbooks are quoted in our exposition and listed in the references.

[1] See Everett (2017).

1. Introduction.

Not everything is a thing.

*"... a **noun** makes us search for a **thing** that corresponds to it."*[2]
Wittgenstein, ***Blue Book***

We are "wired" to think about **things**. We see the physical world, the only world that exists, as composed of **things**.

The words *mind*, *soul*, *intelligence*, *consciousness*, *unconscious*, *desire*, *wish*, *idea*, *thought* and many others let us suppose that somewhere inside our heads there are objects that correspond to these words.

The use we make of these words shows that each of them corresponds to several heterogeneous phenomena. Marvin Minsky (1985, 2007) calls words like *mind*, *intelligence*, *consciousness, ...* **suitcase words** because each one of them regroups several different **mental functions**, and we call them **umbrella terms** [3]. Minsky believed that what we call the *mind* is a loosely organized composite of approximately 400 **mental functions**, more or less interconnected.

The illusion that we have a *unified mind* is itself a necessary [4] **mental function** that allows us to fully dedicate ourselves to the business of

[2] "… ein Substantiv läßt uns nach einem Ding suchen das ihm entspricht." in the German translation of Petra von Morstein (1958).
[3] Minsky's term *suitcase word* may lead to confusion because it translates to *mot valise* in French that in tour translates to *portmanteau word* in English that is an entirely different concept: A *portmanteau word* is a term that refers to words created by combining the sounds of two or more separate words, like "brunch" (breakfast + lunch), "smog" (smoke + fog), and "stagflation" (stagnation + inflation).
[4] That Dennett (2017) sees as a *user interface*.

carrying on with our lives instead of trying to comprehend the workings of our **mental functions** that are not designed to comprehend themselves, and mostly not designed to comprehend at all.

Daniel Dennett (2017) introduces the notion of **competence without comprehension**, stating that **comprehension** is not a precondition to **competence** but, on the contrary, **competence** is first, and **comprehension** may or may not follow.

Minsky (1985) defines **competence** as **knowing how**, and **comprehension** as **knowing why**.

All living beings have **competence**, that is, **skills** to survive and reproduce. Only humans have **comprehension**, that is human language skills to explain our competences to ourselves and to others, and tell stories about them.

We use the term **mental functions** to refer to what Minsky defines as **agencies**. These **agencies** are essentially **competences** that are responsible for performing specific, discrete **tasks**. Each task is composed of smaller, precise functional units, referred to by Minsky as **agents**. Each **agent** is responsible for executing, or impeding the execution, of a single step within a task.

Depending on the level of analysis that we apply to a mental function, we may see an **agency** as an **agent**:

> "When you drive a car, you regard the steering wheel as an **agency** that you can use to change the car's direction. You don't care how it works. But when something goes wrong with the steering, and you want to understand what's happening, it's better to regard the steering wheel as just one **agent** in a larger **agency**: it turns a shaft that turns a gear to pull a rod that shifts the axle of a wheel. Of course, one doesn't always want to take this microscopic view; if you kept all those details in mind while driving, you might crash because it took too long to figure out which way to turn the wheel."
> (Minsky, 1985 p. 23)

To provide an analogy, **mental function agents** are like workers on an *assembly line*. Each **agent** is assigned to execute one step in the production of a task. Meanwhile, there is another agent that supervises the execution of that step.

The *assembly line* analogy has its limitations. While a factory typically has thousands of workers, mental functions are composed of billions of interconnected **agencies** and **agents**, with trillions of connections between them. Furthermore, the mental function encompasses a much broader range of capabilities and products compared to major corporations like Unilever and Procter & Gamble combined.

In a factory, the decision-making process is **top-down**, with directors overseeing the operations. However, in the context of mental functions, the process works in a **bottom-up** manner. This means that mental functions are not dictated by a centralized authority, but rather emerge from the interactions of its individual **agencies** and **agents**.

Additionally, *assembly lines* operate **sequentially**, with one step following another, in the same way computers function. In contrast, *mental functions* operate **parallelly**, with multiple steps being executed simultaneously. This parallel processing is necessary because the speed of electrical transmission between neurons in the brain is very much slower (inferior to 100 meters per second) than the speed of computer transistors (10 million times faster), that can approach speeds of about 50-80% of the speed of light (Rodriguez-Ramos, 2018). The brain's processing efficiency and speed would be considerably reduced if it operated sequentially, as do computers.

The reason you may find this difficult to grasp, even literally *mind-boggling*, is that our minds are not equipped to comprehend their

own internal processes [5].

To understand what follows, it's of utmost importance to break the habit of thinking in terms of **things** and try to think in terms of **functions**, **events**, and **processes**.

Since Descartes, all studies of the mind have been trapped in **dualism**. That is, the belief that **mind** (*res cogitans*) and the **body and the material world** (*res extensa*) are two separate types of reality. The **mind** is a *spiritual reality* subjected to the **laws of reason**. The **body and material world** is a *physical reality* subjected to the **laws of physics**.

This dualistic view is the product of a misunderstanding that stems from the notion that matter and the material word are only made of **things**. Even **atoms** and **elementary particles** are conceived as things. Soviet Marxist psychologists spoke of *superior organization of matter* to refer to mental and cognitive phenomena, as if these were *better* [6] organized things than usual matter.

The fact is that things are not inert, they constantly interact with other things to produce, modify or destroy other things. The material world is not a frozen stage. It changes constantly and all its parts interact. The physical world is composed of matter, events, functions and processes. The behavior of organisms, that includes **mental functions**, is among these events, functions and processes.

If there is a **dualism** that would be useful, it could be that of **structure** and **function**: Lungs are structure, respiration is function. Muscles are structure, movement is function. The stomach is structure, digestion is function. The heart is structure, blood circulation [7] is function. The brain

[5] *"If the brain were so simple we could understand it, we would be so simple we couldn't."* —Emerson M. Pugh, (1977) ***The Biological Origin of Human Values***. Quoted by Dennett (2017) p. 371

[6] 'Superior' and 'better'in this context, are value judgments that have no place in scientific discourse.

[7] Blood circulation and the function of the heart were not known before 1628, when William

is structure, thinking is function. Each of these functions involve several structures, and some of these structures have several functions.

Mental functions only represent a fraction of the brain's activities. There are many brain functions, like heart rate, rate and depth of breathing and sleep-wake cycle that are not mental.

In the following pages, we'll try to present the origin of the *mind* and *mental functions*, and briefly discuss a small selection of these.

Harvey published its discovery.

2. In the beginning…

In the beginning of life, of any and all forms of life, there is a **membrane**, an organ that separates the **inside** from the **outside** of the life form. The membrane is not an impervious separation, it regulates the multiple exchanges with the outside like nourishment, breathing, excretion, …

For any organism there are two environments: The **internal environment** and the **external environment**.[8]

Pascal and Pross (2023), referring to all life forms, including the most "simple" [9], consider that the interactions between the inside and the outside of the organism originate the **mental functions**:

> "On the one hand the DKS system [= **D**ynamic **K**inetic **S**table system = living being] is materially distinct and separate from its environment, yet due to its total dependence on its environment, it is necessarily aware of that environment. Thus, it is within that duality that the origin of 'self' can be found – self awareness that derives from external awareness. Moreover, notice in that description we are proposing the physical means by which a mental dimension could emerge. Awareness is not a physical attribute, but rather a mental one. Though mental attributes derive from physical circumstances, they are inherently non-physical, meaning they cannot be detected and measured by physical means. Thus, the dependence of an 'inside' (the DKS system) on its 'outside' (the system's environment) effectively leads to the establishment of a mental domain, a non-physical relationship between a physical system and its supporting environment." (Pascal and Pross, 2023, p. 5. Our brackets)

As we understand it, what Pascal and Pross call *non-physical* is **biological** and has nothing to do with the **metaphysical** *"res cogitans"*.

[8] We owe this notion to Claude Bernard (*milieu interne et milieu externe*). W. Cannon developed this concept and named the organisms' regulation of the **internal environment** *homeostasis* and that of its relation to the **external environment** *heterostasis*.

[9] We write *simple* in quotation marks because in nature nothing is simple, everything is extremely complex. Consider that the "simplest" bacteria have a genome of 2000 genes, that is 10% of the size of the human genome, the species that considers itself the "crown of creation".

As humans, at the species and especially at the individual level, we tend to be very proud of our **mental functions**, but functions of this kind exist in all living beings, even in the most rudimentary [10]. Speaking about bacteria, that are *small but not stupid* [11], Pascal and Pross (2022) say:

> "This simplest of life forms is able to sense its internal condition, coordinate with neighboring organisms, and routinely activate elaborate response systems in response to ongoing challenges. Thus, remarkably, life's mental capability is already apparent at that simplest life level." (p. 6)

The same basic function of the **membrane** that Pascal and Pross (2022) would define as:

> "... that umbilical connection between the system and its supportive environment creates what is effectively an 'inside' linked to its 'outside'." (p. 8)

is in multicellular organisms, like vertebrates, assumed by the **skin** [12].

Answering the accusation that *Behaviorism* denies the existence of an **inner world**, Skinner (1974) writes a whole chapter about ***the world within the skin*** that he describes as *"a small part of the universe that is contained within each of us"*. He adds that *"There is no reason it should have any special physical status because it lies within this boundary."* [13]

A kin concept of **inner world** is given by Wittgenstein's notion of

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[10] Bertrand Russell stated this in 1921: *"... from the protozoa to man there is nowhere a very wide gap either in structure or in behaviour. From this fact it is a highly probable inference that there is also nowhere a very wide mental gap."* (op. cit. p. 41).

[11] Shapiro, J.A. (2007)

[12] The functional affinity between the skin and the brain, as mediators between the 'inside' and the 'outside'corresponds to what we know about embryology.
The neural tissue, including the brain and spinal cord, forms from one portion of the external membrane of the embryo (ectodermal layer) that turns to the inside (invagination).

[13] Technically speaking, this inner world is studied by psychophysiologists as **covert behavior.**

private events. Mental functions as thoughts, memories, dreams, are private events and so are hunger, thirst, tooth aches and pains in general. There is nothing special about private events except for the fact that they are private.

Signaling that we tend to overvalue these private events, Wittgenstein wrote:

> *"Only God sees the most secret thoughts. But why should these be so important?"* [14]

Maybe we just value them more because they are not directly available to others. Carruthers (2011) argues that they are neither directly available to ourselves because:

> *"... our knowledge of our own thoughts (our beliefs, goals, decisions, and intentions) is always indirect and interpretive, no different in principle from our access to the thoughts of other people."*
> Carruthers (2015)

[14] *"Nur Gott sieht die geheimsten Gedanken. Aber warum sollen diese so wichtig sein?"* ***Zettel*** 560

3. The Self.

Like most [15] social primates, we are hierarchical, ruled by alpha-males or their equivalent. Some command, others obey, is a prevailing characteristic of most human societies, and we inherited it from our non-human ancestors.

Little would be left of History if we exclude all the matters that have to do with leaders, rulers, and wars.

Most humans have a **top-down** *world-view* or *Weltanschauung* in which the world is governed by real or imaginary humans, or imaginary gods, demons, ghosts, angels, … The general conviction is that they, for better or worse, are on top and rule the world.

It is truly anguishing to accept the idea that there is nobody in the *driver's seat* of *spaceship Earth*, and that there is no global command or control system. The need to relieve this anguish is the core business of all religions and conspiracy theories. For many, it is more comforting to believe in the existence of malevolent forces governing the world than to consider the possibility that there is no governance whatsoever.

Now, imagine how anguishing it must be to envision that in our minds there is nobody in the *driver's seat*. That there is nobody ruling or planning, and that there is no **free-will** (Dennett, 2017; Harris, 2012)

There is something *supposed* to be in the *driver's seat* and held responsible for that. That is the **group of mental functions** that we label with the *umbrella term* **Self**.

We saw in the previous section that Pascal and Pross affirm that a rudimentary form of **Self** exists even in bacteria and archaea. These

[15] Bonobos are an exception to this rule.

unicellular organisms, that are *small but not stupid*, were the only form of life on Earth for 2 billion years, and persist today, that is 4 billion years after their first appearance, without major changes and in perfect shape, in pristine condition. These organisms have a **Self** that **comprehends** nothing, but has the **competence** to distinguish between **in** and **out** and assure *homeostasis* for the *in* and *heterostasis* for the *out*. This regulation between the internal and external environment is a function of the membrane [16].

Moreover, all living beings have the **competence** [17] to differentiate themselves from others, and members of their species from all other living forms.

In addition to this 'basic Self' that is a general property of life, a great part of our human **Self** is a **social product**:

Imagine that you're walking, distracted by your thoughts, in the hall of a nice hotel, and inadvertently hit with your leg an expensive vase that stood near your way. The vase falls and breaks, and you have to pay for it, although you had no awareness of the presence of the vase and not the slightest intention of breaking anything.

Society trains and forces us to take responsibility for our acts. We may call it a 'legal Self'. This Self, created, taught and trained by society, is also interiorized, and we become in the same manner responsible towards ourselves, which inclines us to attribute to our Self commanding functions over our behavior and over our other mental functions [18].

For Dennett (2017) the belief in this **ruling Self**, the 'captain' of our 'mental ship' is an *illusion*. We contend that it is a *necessary illusion*

[16] Freud (1923) placed his imaginary *Ego*, that assumes the function of *Self*, in the 'external layer' of his imaginary *psychical apparatus* ("*oberflächlichen Schichten des seelischen Apparates"* p. 293).
[17] Not the knowledge.
[18] Freud (op. cit.) compared his imaginary *Ego* to the *rider* that governs the *horse*.

and, as such, is a **mental function**, with a moderate to weak amount of influence over some other mental functions. The 'commanding power' of the **Self** can be compared to that of a weak *constitutional monarch* without a Parliament and government of Her or His Majesty. Our **free will** does not exceed that 'power' and does not direct the workings of the **mental functions** that, instead of being hierarchically organized **top-down**, work **bottom-up**.

Our cousins, the Bonobos, have no alpha-males and are ruled by a female collective. Humans also have instances of **bottom-up** societies:

- Daniel Everett (2017) describes the *Piraha* tribe from north-western Brazil, that he considers the happiest people on the planet, and have nothing like a leadership.
- The Israeli kibbutz is also a **bottom-up** organization.
- Socialist Yugoslavia had self-managed companies where all employees and stakeholders participated in decision-making.
- The Athenian democracy (508-322 BC) was a **bottom-up** political system.
- On a larger scale, Switzerland (= the Swiss Confederation) is a **bottom-up** decentralized direct (non-representative) democracy. [19]

All nature, except for alpha-male ruled societies, works **bottom-up**. Natural selection is a *design without a designer*, *competence without comprehension* (Dennett, 2017), a *blind watchmaker* (Dawkins, 2015).

[19] Do you know that Switzerland has a president? Do you know his name? If you don't, no worry. Switzerland's president has even less powers than that of the Self in your mind.

4. Consciousness

"I don't understand what consciousness is, can't define it. I can't understand philosophers' writing about it. Or neuroscientists', for that matter, unless it's "consciousness" in the boring neurological sense, like not experiencing consciousness because you're in a coma."
Sapolsky (Op. cit.)

"the only thing we are sure about consciousness, is that it is soluble in chloroform."
Luca Turin

One main distinction we have to make is between **consciousness as a brain function** and **consciousness as a mental function**.

As a **brain function**, consciousness is synonymous with the physiological activity of the brain and the central nervous system. There is nothing specifically human in this type of consciousness. It is a spectrum of levels of activity that goes from the pathological states of **hyperarousal** to **coma**, passing through the normal stages of **waking** where there is concentration and focussed attention, **subwaking** linked to 'daydreaming' and lack of focus, **hypnagogic state** when falling asleep, and 5 **sleep stages** from most shallow to deepest.

As a **mental function**, consciousness is a **social product** based on the physiological **brain function**. It is specifically human. If there is something equivalent in e.g. primates and cetaceans, it would be very different because human mental functions are based on human tools and institutions, human language [20] being the most important [21].

[20] We specify **human language** because cetaceans have acoustic languages and dialects that we can't decipher, and we suppose that they can't decipher ours. Curiously, we show more interest in communicating with hypothetical extraterrestrials than with the intelligent cetaceans in our oceans, that certainly have languages.
[21] Our ancestor, ***Homo erectus***, a successful species that lasted 2 million years (we're at least 1.8

According to Dennett, **consciousness** is a *user illusion*, much like the screens of our smartphones that function as **user interface**. We interact with the app icons and can use them effectively (**competence**), but we lack knowledge (**comprehension**) of the underlying programs and the intricate circuits of silicone chips and transistors that enable the apps to function as they do.

The problem with Dennett's analogy is that we don't have a **user**:

When somebody appears before us, we don't ask ourselves *who is this person?* and then open the 'face recognition app' [22] that will tell us *we know the person, it's Jane Doe*, or will tell us *we don't know who this is* and react accordingly either triggering the 'almost forgotten faces, search tool' when the social context suggests recognition might be expected. If recognition fails or the search yields no results, the 'deal with strangers app' is triggered, proposing options like, for instance, a. ignoring the person, b. introducing ourselves, c. inquiring about familiarity, or d. avoiding them.

There is no **user** performing these operations. The presence before our eyes of a face, that wasn't there before, will automatically trigger these **mental functions**. Any 'user interface' would slow down this process, that is very slow as it is, when we compare it to the 10 million times faster processing speed of computers.

Dreams have a crucial importance in the origin of the main illusions concerning the *mind* as Cartesian mind/body dualism, as being an entity free and detached from the body (out-of-body experiences), as even capable of adopting other bodies and impersonating other beings, human

million years behind to reaching that mark) didn't have vocal language like we do because his vocal cords were like those of present gorillas, but most plausibly had a language based on signs, sounds, face expressions, and maybe rudimentary forms of writing (carvings on stone and wood, drawings on earth and sand, …). See Everett (2020).

[22] There is nothing specifically human in face-recognition, all social primates have it. The neurological substrate of this function is in the occipito-temporal lobe.

or animal.

These type of experiences, labelled **altered states of consciousness** can also be provoked by psychotropic drugs or mental disorders. The particular interest of dreams is that every normal person experiences them.

Dreams are a normal, typical and recurrent **altered state of consciousness** a form of what, for the awake consciousness, is labelled **hallucination**.

Hallucinations are very common and can be truly bothering and even dangerous. Dennett (1992) gives the following example:

> *"Why ... does the hunter on the last day of deer season see a deer, complete with antlers and white tail, while looking at a black cow or another hunter in an orange jacket? Because his internal questioner is obsessively asking: "Is it a deer?" and getting NO for an answer until finally a bit of noise in the system gets mistakenly amplified into a YES, with catastrophic results."*
> p. 13

Dennett (ibid.) explains this behavioral perceptual phenomenon by postulating the existence of a functional cycle with two sides: a **hypothesis-generation** part of the cycle (the **expectation-driven** side) and a **data-driven** part (the **confirmation** side). The more the **expectation** is *high* (it's the last day of the season, my last chance), the more the requirement of **confirmation** is *low*.

It's a very common and bothering experience that when we have an appointment with somebody in a public place, as the appointed time draws nearer, the probability of perceptually mistaking somebody else with the person we are waiting for increases. If the person is slightly late, the frequency of such perceptual mix-ups tends to increase until it begins to wane as the person gets exceedingly late or fails to show up at all.

Besides the intensity of the **expectation**, other factors may concur: The bigger the crowd in the public venue, the greater the probability of 'false positives' for the **confirmation**.

Dennett (ibid.) explains **hallucinations** as the product of disordered or random or arbitrary rounds of **confirmation** and disconfirmation of perceptions, of which the **expectation** side tries to make sense through **storytelling**.

This **expectation/confirmation cycle** can be assimilated to the **activation-synthesis hypothesis**, proposed by Hobson and McCarley (op. cit.), to explain how the brain generates dreams.

Of all the known hypotheses about the functions of dreams, we prefer the most parsimonious that postulates that dreams are an **ontogenetic vestige** of an **endogenous activation** (See Hobson, 2009) of the brain during the fetal stage. The fetal brain evolution, needing stimuli to develop, generates its own dreamlike state in the absence of external stimulation.

This makes us suppose that it is not improbable that dreams have no function in the already born. It is not necessarily the case that everything in existence serves a purpose or has to fulfill a particular function.

The sense we find in dreams is **apperceptive**, as the sense we give to **Rorschach** ink blots or to sound stimuli in Skinner's **Verbal Summator**. The **expectation** (Dennett) or **synthesis** (Hobson and McCarley) give sense and structure to **endogenous stimuli** (Dennett's **confirmation** and Hobson and McCarley's **activation**).

The sense is not in the stimuli, but in the perception and storytelling that the dreamer makes of them:

"...dreams have little more meaning than the shapes of clouds or the

patterns of butterfly wings. They neither announce nor reveal anything."
Roger Callois [23]

[23] *"... les rêves ont à peine plus de sens que les formes des nuages ou les dessins des ailes des papillons. Ils n'annoncent ni ne trahissent rien."* Roger Callois (1956), **L'Incertitude qui vient des rêves**. Gallimard

5. Attachment

Attachment develops instinctively in all vertebrate species whose offspring require intensive parental care. In some *altricial* [24] animals like elephants, bears, great apes and humans, the dependence of the young on maternal care and protection lasts up to 6 years. The earliest days of life are essential to the development of this group of mental functions (Horst, 2009).

In humans (Gould, 1985), bonobos (Palagi and Cordoni, 2012) and dogs [25] (Price, 1999) there is a persistence of juvenile attachment modalities into maturity called *behavioral neoteny*. Among other traits, like curiosity and playfulness, it's characteristic of these beings to remain loyal and close to those that have raised them.

The most conspicuous form of **attachment** is *love*. In humans, this *love* received from parents is interiorized as love for oneself, aka **narcissism**.

Among our mental life's earliest tacit assumptions, we find the ideas that 1. We are the center of the world [26], and 2. That we are here forever.

Most of us detach, with much pain, rather sooner than later, from the 1st assumption because reality shows us that others are receiving as much or more attention than we.

Conversely, most never detach from the 2nd assumption, that our mental life exists endlessly, for there is nothing to prove us that with death it ceases to exist [27]. This assumption is also an important factor in grief, funeral rituals and cult of the dead ancestors. The belief in the

[24] Term used to describe young animals that are born in a relatively undeveloped state and require significant care and attention from their parents to survive.
[25] This enumeration is not exhaustive.
[26] As the ancients thought that the Earth was the center of the Universe, and the Chinese that China is the center of the World.
[27] And despite the fact that with dementia, it ceases to exist while remaining alive.

persistence of the mental life of the deceased (afterlife) is reinforced by the endurance of the memories, feelings, perceptions of the deceased in the mental life of the bereaved [28].

Experiences of separation, loss, or sexual assault can impair the 'attachment machinery' [29] for prolonged periods.

Associated to narcissism are the notions of being **unique** or **special**, which have a factual base because there are no two identical snowflakes, each grain of sand is unique, so why shouldn't each person be unique? Indeed, we are, but that's no reason for self-infatuation because, as somebody said:

> *"Always remember that you are absolutely unique. Just like everyone else."*

It follows that it is an apparent paradox that *being **unique** doesn't make us **special***.

This form of narcissism can be extended to the subject's family, clan, tribe, social class, 'race', nation … Jingoism, chauvinism and racism belong to this category.

Shared storytelling, especially **beliefs**, has a primordial role in the establishing and maintaining social bonds.

Not sharing beliefs can lead to life-threatening **rejection** and ostracism. Any social animal will go to great lengths to avoid such rejection.

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[28] Most belief systems, as well as psychologists and psychiatrists, define the 1st year as the most intense period of mourning. This can be psychologically explained by **behavioral momentum** and **resistance to extinction**.

[29] Using Minsky's expression.

6. Beliefs

The notion that human behaviors are guided or caused by **beliefs** is generally accepted. Harari (2015) holds that **beliefs** shape behaviors.

Beliefs are a form of **storytelling** used to induce, inspire, motivate and justify behaviors. We use beliefs to explain to ourselves and others our behaviors and that of our fellow humans.

That **beliefs** psychologically explain our and other people's behaviors is just **storytelling**, suggesting that *beliefs contain the causes of behavior, and if we examine these beliefs, we can disclose these causes*.

However, we have examined **beliefs**, mostly those called 'religious' [30] for almost thirty years (Preschel, 2022), and we have reached the conclusion that individuals and societies use **beliefs** as **rationalizations** to justify behaviors intended to satisfy biological imperatives that, in social animals like us, include social needs.

- Very few people became *Communists* because they read Marx and Engels' ***Communist Manifesto***. We can be sure that nobody became a *Marxist* because she or he read ***The Capital***.
- Nobody became a *Nazi* because she or he stumbled, out of the blue, on a volume of ***Mein Kampf***, read it, and became fully convinced.
- Nobody became a *Muslim* because of reading and understanding the ***Qur'an***, that is a document without head or tail, impossible to understand [31].
- Understanding the ***Bible*** can lead to serious misunderstandings [32].

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[30] 'Religion' is a Christian concept. As we live in a civilization of Christian origin, we tend to call Buddhism, Shintoism, Hinduism, Judaism, Santeria, Animism, Paganism, … 'Religions'. More than an *umbrella word*, seeing every 'belief system' as a *religion* is due to a *cognitive bias* called the Law of the Instrument, that translates: *To a person with a hammer, everything looks like a nail*.

[31] For a more detailed description of the ***Qur'an,*** see Preschel (2021) p. 12.

[32] That happened to Uriel da Costa (1585-1640), a descendant of Portuguese Jews converted to Catholicism. Da Costa was born and grew up as a pious Catholic until he discovered and read the ***Old Testament*** and got so seduced and convinced by it that he immigrated to Amsterdam and

There are multiple examples where reality blatantly contradicts basic beliefs, such as precise prophecies that simply don't happen. After the moment when the prophecy fails, the *unaccomplished* prediction is transformed into an *accomplished* one, like:

- It did happen, not here on Earth but in Heaven.
- It didn't happen materially, but it did spiritually.

Mathew Hartke (2022) explains through **cognitive dissonance** these types of *adaptations* of the beliefs to the *new realities*.

We suggest a more simple explanation for these phenomena:

To begin with, the *community of believers* didn't come together, nor held together, because of the *common belief*. They came and held together to satisfy social, economical and affective imperatives. The *common belief* is a **storytelling** that provided a shared imagined reality that bounded the *believers* together and allowed them to organize themselves effectively to satisfy the social, economical and affective needs of its members.

When the anticipated day arrived, and the prophecy of the belief should have been fulfilled, yet it failed, and the objective reality of this failure became indisputable, that did not make disappear the social, economic, emotional, and affective needs that bound together the *community of believers*. Instead, the belief underwent more or less subtle adaptations (through mystification, symbolization, spiritualization, etc.) to

converted there to Judaism. Soon after his conversion, he discovered that the Judaism of the Rabbis had little to do with the ***Old Testament*** and much to do with the ***Talmud***, of which he had no notice, before emigrating from Portugal. Thus, he wasn't at all convinced or seduced by the latter and began to openly criticize the rites and beliefs of the Rabbis. That led to his excommunication (*herem*), resulting in total social exclusion, which ultimately caused his premature death.

accommodate the new reality and maintain the functioning of the community, ensuring the continued satisfaction of their collective needs.

Using Marxist terminology, **beliefs** are a **superstructure** that conceals the underlying **infrastructure** formed by the material needs of the community members.

This concept applies to beliefs in any domain such as politics, ideology, economics, diet, and even science. It also explains why changing someone's opinions can be almost impossible, especially when this person has social, economic, emotional, and affective incentives to hold on to her or his beliefs.

The idea that **believers are manipulated by their beliefs** is widely accepted. We affirm that, to the contrary, **beliefs are manipulated by their believers**.

Let's take a closer look at the sadly frequent case of **suicide bombers**. They are almost always in their teens, an age where impulsivity and disregard for the value of life may easily prevail. Moreover, the instigators elicit in them psychological motivations by telling them that they have been chosen by God because they are exceptional beings, and that they will acquire great status as *martyrs* and, as such, enjoy a great *afterlife* with 72 virgins [33] at their disposition. Additionally, in this life, financial compensation and reward are pledged and provided to the family of the self-sacrificed youngster. This clearly suggests that beyond, or instead of, beliefs in spiritual ideas, there are very down-to-earth motivations for the behavior of a suicide bomber.

[33] This promise is especially appealing to those that never had sex.

There is a consensus that the brain reaches its full development around the age of 25. The latest to develop is the prefrontal cortex, where the inhibitory functions are located.

In the USA, suicide is the third leading cause of death, after unintentional injury and homicide, among individuals between the ages of 15–24 [34]. That military conscription begins at 17–18 years and not at 25, may be linked to this fact.

The willingness of individuals to sacrifice their lives for their country has intrigued evolutionary biologists. E.O. Wilson (op. cit.) explored the evolutionary benefits of **altruism**, including self-sacrifice, which, by definition, is fatal for the individual but may confer advantages for the species. Natural selection operates based on the survival of the species, not that of the individual organism (Pross, op. cit.).

[34] NIMH Suicide.

7. Natural and artificial Intelligence

Intelligence is a champion among *umbrella words*. It's surprising how in the public discourse, *intelligence* is treated like a potent capability, and for that matter, the strongest and most dangerous. It's a common place for many religions [35] to describe God as *supreme intelligence*.

Actually, **intelligence** is an *umbrella word* for a variety of **skills**. The skills that IQ tests measure are: verbal, mathematical, spatial reasoning, logical reasoning, memory, speed, and knowledge.

AI is already very good in mathematical, memory, speed and verbal skills. The verbal skills in large language models (LLMs) are so good that they emulate reason and give the user the impression that they're reasoning, while they're actually joggling with astronomical amounts of words, at 50-80% of the speed of light, to convey that impression.

This new openly available technique will impact the job market as the printing press destroyed jobs of scribes, the records destroyed jobs of musicians, the radio destroyed jobs in the record industry, the cinema destroyed jobs in the theaters, the TV destroyed jobs in the cinema, the Internet destroyed jobs in all the previous mentioned industries and many others. AI will surely destroy many jobs, but like the printing press, the record industry, the radio, the cinema, the TV and the Internet, AI created many jobs and will create many more.

In any way you define intelligence, the Internet has made us more intelligent, and AI will do the same.

Those who most risk **job destruction** are those who routinely do repetitive intellectual tasks with the least possible effort, instead of trying to optimize their productivity. As long as no machine could replace them, they enjoyed a vested right to cozy up in their comfort

[35] Deism, Theosophy, Freemasonry, and Christian Science, among others.

zone. Those who work like robots are the most at risk of being replaced by robots.

AI will free intellectual workers from menial chores as typing machines, word processors, and the Internet did before.

This technology is a *menace* for those wishing to rest on their laurels, and is a *blessing* for those constantly seeking to expand their skills.

After all, it's never stated that life is a bed of roses.

Having discussed the **job destruction risk**, we will now address the **AI extinction risk** stated by an important group of prominent AI experts and public figures, and then, the risks seen by Harari (2023).

Let's start with an anecdote:

"Twenty or so years ago, when Jacques Chirac was president of France, there was a man in Paris who lived with his daughter. The man didn't like the president, and every time he spoke on TV, the man critiqued him, while sitting before his TV screen, saying things like, ***"How can he be so dumb?"****,* ***"He's dumber than cow dung!"****, and* ***"He should make it to the Guinness World Records for being the dumbest man on Earth."***

One day, after the daughter had just learned in school about the institutions of the French Republic and the highly esteemed role of the president, she asked her father, upon hearing his usual reaction to the president's words, ***"Dad, how can the President of the Republic be as dumb as you suggest?"*** *Her father responded,* ***"Because he possesses something much more important than intelligence, he has a very strong will. He is the president of the republic because nobody desires to be the president as much as he does."****"*

Will in contrast to **intelligence** is the key concept we wish to convey from this anecdote because **will is biological**, and no machine can have it.

For AI to destroy humanity, as fear the signatories of the *extinction statement,* if it doesn't do it accidentally, it should have the **desire** to do so.

No machine can have desire, will, ambition, seduction, anger, hate, fear, thirst, hunger, selfishness, etc. These inclinations, feelings and emotions belong to what biology calls **agency**. To have **agency,** you must have **metabolism** and **genetics**, you must be a **living organism**, regardless of your size.

There are risks of extinction, Putin is presently the most worrisome. There can be catastrophic nuclear accidents, solar explosions, meteorites, volcanos, etc. that can provoke extinction. AI is not one of these risks.

A machine having agency is as improbable as a machine that urinates, defecates and eats lemon pie.

We find the Harari (ibid.) argument more plausible. Harari fears that machines could become better performing at storytelling than humans. This could be actually very possible, and writers, painters, photographers, designers, among others, already feel challenged by the present capabilities of AI. There is nothing improbable in that AI may become better at storytelling than humans.

We differ with Harari in the assessment of the consequences of, let's call it, *AI storytelling hegemony*. Harari is right in stating that storytelling and gossip are essential for the functioning of human societies. In this sense, Harari thinks that storytelling like myths, sacred texts, and ideologies, rule societies, and that if AI is better at creating them, it will take over the power.

Harari is philosophically an *idealist*, not because he belongs to that school of thought, but because he believes that *ideas lead the world*.

We don't share that belief because societies exist to satisfy biological needs, and are ruled by material constraints and interests and ultimately by the laws of physics (Preschel, 2023).

Storytelling, as important as it may be, is subordinated to these constraints. So will be the most advanced and perfect *storytelling machine*. Storytelling and gossip are **superstructures**.

8. Conclusions

In this short essay, we have attempted to **explain** the concept of ***mental functions*** and describe some instances of them. From our perspective, ***mental functions*** **should not be used as explanations** of internal or external events. ***Mental functions*** don't **explain** anything, they should be **explained**.

In technical psychological jargon, **mental functions** are the *dependent variable*, the *independent variables* are the body processes are the interoceptive, proprioceptive and exteroceptive physical, social, cultural, and affective stimuli from the internal and external environments in which the body exists.

We don't exclude that mental functions can cause behaviors. Mental functions **are** behaviors, but from a methodological point of view they are useless as explanations. A mental function is always something to be explained, and if we 'explain' it by another mental function, then we should explain it in turn until we arrive at a cause that is not a mental function.

Takeaways

- Mental functions are to be explained and not to be used as explanation.
- Beliefs don't guide people. People use, tweak and adapt beliefs to rationalize their behaviors.
- AI is nowhere near the track to producing **agency** that is a property of living beings. If, in the far future, agency will be artificially generated it will be done by biological engineering and not by IT.
- You're cleverer than AI, but "evolution is cleverer than you are."[36]

[36] Orgel's Second Rule.

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